

NOXIOUS TIMES

A Quarterly Publication of the California Interagency Noxious Weed Coordinating Committee

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NPDES Permit Debates Continue



The Clean Water Act (CWA) is the principal law governing pollution of our nation's rivers, lakes, estuaries and coastal waters and calls for a National Pollution Discharge Elimination System (NPDES) permit each time a substance (pollutant or discharge) is introduced to a waterway. After a landmark legal decision in 1999, what had been routine applications of herbicides for aquatic weed control became the discharge of pollutants. This evolving area is being closely watched by those on all sides of the debate.

continued on page 6...

Cal-IPC Symposium 2005

The California Invasive Plant Council (Cal-IPC) Symposium 2005 is entitled "Prevention Reinvention: Protocols, Information, and Partnerships to Stop the Spread of Invasive Plants." The Symposium will take place on October 6 - 8, 2005, at the Bell Memorial Union, California State University, Chico in Chico, CA.

Speaker sessions include:

Protocols and Practices for Stopping Weed Movement
IPM Laws & Regulations
Riparian and Wetland Invasives
Cal-IPC Business Meeting
Comparing Control Methods
DNA to GIS: New Techniques and Ideas
Inventory and Prediction for Stopping Weed Spread
Safe and Effective Use of Chemical Control
Building Effective Programs and Partnerships
Partnerships for Early Detection and Rapid Response



Cal-IPC

Included in the Symposium are posters & exhibits, working & discussion groups, a social hour & not-so-silent auction, photo contest, banquet dinner & awards presentation, and four field trips.

Preceding the Symposium will be a Wildland Weed Field Course on Wednesday, October 5, from 8 am to 5 pm in Chico and will cover control strategies.

For registration information and a detailed program, please visit Cal-IPC's website: www.cal-ipc.org.

Late Breaking News
STATE WEED PLAN released!
www.cdffa.ca.gov/weedhome

CINWCC Chair

Bobbi Simpson, National Park Service

California Interagency Noxious Weed Coordinating Committee

Meeting Overview

Questionnaire Results – Education is CINWCC's #1 priority

On August 18, 2005, Bobbi Simpson presented the results of last meeting's questionnaire on CINWCC's membership, focus, and whether the name should be changed. Education received the most votes to be CINWCC's top priority, followed by prevention and rapid response.

CINWCC was originally established through an MOU of state and federal agencies, but at this time the MOU no longer serves the group. The group discussed whether CINWCC should remain an agency group with non-governmental organizations as non-voting affiliates, or should invite more NGOs to participate. In conjunction with this, the possibility of a name change was also debated.

Most present did not have strong opinions on either of these issues and were amenable to both inviting more groups to participate and changing the name to make it easier to pronounce, and to reflect that its focus expands beyond state-listed noxious weeds to include all invasive plants.

The group discussed how CINWCC can decide to pursue some kind of educational program. It was decided that members will ask their agencies what type of educational materials would be most useful and what audiences they want to target. Information should be returned to Bobbi by Sept. 15. We will decide which niches need to be filled in weed education. A suggestion was made to ask Carla Hoopes, the Montana Weed Coordinator, to attend a CINWCC meeting and talk about how to run a coordinated weed education program.

Noxious Times is a publication of the **California Interagency Noxious Weed Coordinating Committee (CINWCC)**. The committee was formed in 1995, when 14 federal, state, and county agencies came together under a Memorandum of Understanding to coordinate the management of noxious weeds. The committee's mission is to facilitate, promote and coordinate the establishment of an Integrated Pest Management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

The Noxious Times newsletter intends to help the committee achieve its goals of coordination and exchange of information by providing land managers throughout the state with information on weed control efforts, news, and successes.

Noxious Times is published quarterly by staff of the Integrated Pest Control Branch at the California Department of Food and Agriculture. We welcome submissions for our upcoming issues. Please send to: CA Department of Food and Agriculture, ATTN: Noxious Times, 1220 N Street, Room A-357, Sacramento, CA 95814 or e-mail: noxtimes@cdfa.ca.gov.

If you have a colleague whose name you would like to add to our mailing list, please send mailing information to the address above.

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RESOURCES *RESOURCES* RESOURCES

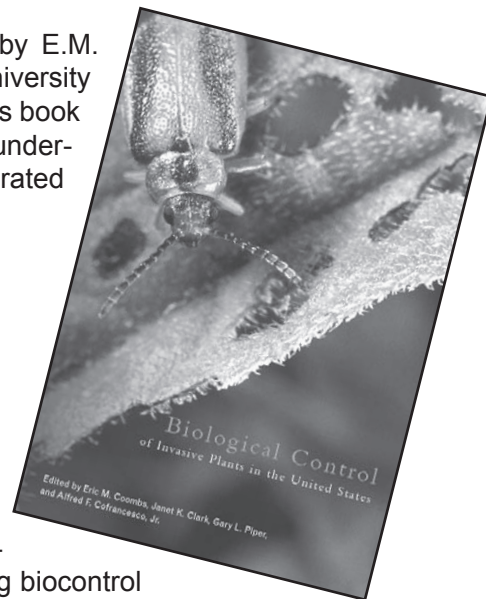
Biological Control of Invasive Plants

Biological Control of Invasive Plants in the United States, (2004) edited by E.M. Coombs, J.K. Clark, G.L. Piper, and A.F. Cofrancesco, Jr., (Oregon State University Press) reviews biological control of invasive terrestrial and aquatic plants. This book contains a compilation of information from the nation's top experts about understanding and safely implementing biocontrol as a part of a long-term, integrated weed management program.

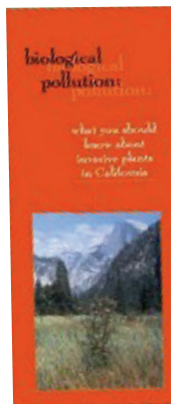
"Anyone interested in weed biological control would find this book extremely useful."

Mike Pitcairn, CDFA Biocontrol Program

The book contains three sections that cover many of the important issues in biological control: 1) the theory and practice of biocontrol, 2) target plants and the biocontrol agents, and 3) new and ongoing biocontrol projects in the United States. Topics addressed include ecology, safety testing, nontarget impacts, and the process of identifying, introducing, distributing, and monitoring biocontrol agents. Chapters contain color photos and complete reference lists.



Cal-IPC Biological Pollution Brochure



New brochure! "*Biological Pollution: what you should know about invasive plants in California*" informs a general audience about the ecological and economic impacts of invasive plants.

What are invasive plants? How do they get here?
How do they spread?

The California Invasive Plant Council (Cal-IPC) has put together an informative and attractive brochure that addresses these basic questions with simple,

concise answers. This brochure includes a list of impacts, which are excellent talking points when discussing the issue of invasive plants. Complete with dramatic landscape photographs and a sensible, realistic action list, Cal-IPC's biological pollution brochure is a compelling resource for introducing new weed warriors to the issue.

Please visit Cal-IPC's website for more information and to view a PDF: www.cal-ipc.org.



INVASIVE PLANT RESOURCE GUIDE



Developed by the Center for Invasive Plant Management, the online *Invasive Plant Resource Guide* is a reference for materials (fact sheets, handbooks, booklets, etc.) that support invasive plant management and education. The materials cover a wide array of topics ranging from weed management strategies to natural resources to "working with people" skills.

For each item, a description is provided as well as a link to the source. Most items are available for download or in hard copy at no cost.

Find the Resource Guide at:

www.weedcenter.org/resource_guide/rg_cover.html

Janet K. Clark, Director Center for Invasive Plant Management

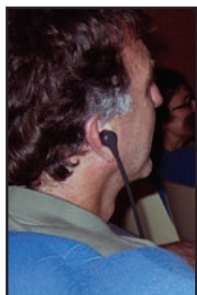
International Workshop: "Invasive Plants in the Mediterranean Type Regions of the World"



Workshop attendees gather outside the meeting hall in Mèze. Hey, isn't that *Cortaderia*!?!



On May 25, 2005 in Mèze France, 110 professionals ranging from scientists to conservationists from 24 countries met to discuss the threat of invasive weeds. Discussions covered threats to the environment, biodiversity and economy faced by the world's five Mediterranean-type climate regions: southern Australia, California, Chile, the Cape region of South Africa and the Mediterranean Basin. The purpose of the workshop was to discuss the possible ways to address the threat of invasive plants.



With some talks delivered in French, Joe DiTomaso listens to the English translation.

At this conference, organizations were congratulated for existing initiatives, and further cooperation was encouraged. This gathering of experts was agreed to be a great step down a long path that needs even further encouragement from government agencies, scientific institutions, and nongovernmental organizations. All parties concurred that further education and awareness would alleviate much of the burden on small interest groups and get more people involved.



Part of the American delegation (from left to right): Valerie Vartanian, Nature Conservancy; Joe DiTomaso and Sue Webster, UC Davis; and Steve Schoenig, CA Dept. of Food and Agriculture. Not shown: Emma Underwood and Karen Jetler, UC Davis, and Mark Renz, New Mexico State University.



Imported pampas grass, just for the occasion.

Other topics discussed at the workshop were:

- Shared experiences
- New skills
- Best-known practices
- Technologies
- Data on inventory
- Monitoring
- Management
- Prevention
- Control and eradication
- National legislation and regulations



Not bad scenery for a workshop.

For more information visit:

www.eppo.org/MEETINGS/2005_meetings?workshop_invasive/workshop.htm ♦

Did you know...

Scotch thistle, one of California's A-rated weeds, has been credited with helping the Scots defend their land from Viking invasion.

Legend has it that one night in 1263, in hopes of conquest and plunder, the Vikings moved into Scotland for a surprise attack. Stumbling through jagged thistles, they yelped out in pain! Their



SCOTTISH
PENDANT

cries alerted the Scots, allowing them to drive out the Vikings. Inspired by that fateful night, Scotch thistle became a national emblem of Scotland. Scotch thistle was probably introduced to North America as an ornamental plant in the late 19th Century. References: www.nwcb.wa.gov/weed_info and www.killerplants.com/plants-that-changed-history



ORIGINAL ARTWORK BY KEITH YOUNG. SCOTCH THISTLE PHOTO, CDFA.
GRAPHIC COMPILATION BY JUDAH GROSSMAN, UC DAVIS.



NPDES Permit Debates Continue

BY CHERYL WOODS,
CDFA

The objective of the Clean Water Act (CWA) is the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Implementation and enforcement of the CWA has been delegated to the California Environmental Protection Agency (EPA) State Water Resources Control Board (SWRCB) by the USEPA.

Programs in the CWA have been primarily directed at managing point source pollution (wastes discharged from industrial facilities, sewage treatment plants, and municipal storm sewer systems). In order for an industry to discharge pollutants into a waterway they must first obtain a NPDES permit for all "point source" discharges containing pollutants (point source polluters include direct line pipes from factories or treatment plants) are assigned a performance standard based on the best water pollution control technology available that has been found to be obtainable and economically achievable.

In general the NPDES regulations, have resulted in cleaner water and other community benefits. Many bodies of water have regained the criteria necessary for swimming, fishing and other water activities based on lower levels of toxicity compared to previous years.¹

The "Talent Decision"

The EPA states that its regulations apply to all waters in the United States, and this was the position emphasized by Headwaters Inc., a nonprofit environmental corporation that filed suit against the Talent Irrigation District (TID). TID, located in Jackson County, Oregon, maintains a series of irrigation canals, and in order to control the weeds and vegetation in their canals, TID used the aquatic herbicide Magnacide H containing acrolein. This herbicide is toxic to fish and other wildlife if used inappropriately. The TID had never applied for a NPDES permit to discharge the chemicals into the waterways, and in May 1996, TID applied Magnacide H into its canals. The next day, many fish were found dead in a nearby creek by the Oregon Department of Fish and Wildlife. It was determined that over 92,000 juvenile steelhead fish were killed as a result.

In 1998 Headwaters Inc. brought a citizen suit against the TID under the CWA. Headwaters alleged that the TID was in violation of CWA when it discharged Magnacide into irrigation canals that eventually lead into the creek where the fish were killed. Headwaters stated that a NPDES permit was required to discharge chemicals into the canals and creek. This case was a bit of an oddity because normally this part of the Clean Water Act is meant to address industries that produce a chemical as a byproduct and discharge the waste into water. In the case of the TID, they meant to discharge Magnacide into the water

in order to rid the canals of problematic aquatic weeds.

The Ninth District Court of Appeals upheld a lower court's ruling that an NPDES permit was required to intentionally apply chemicals to these "waters of the US." The court stated, "an applicator of herbicides was required to obtain an NPDES permit under the circumstances before the court." Interestingly, because the required holding time of the Magnacide-treated water was not met, this decision was in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the label requirements that it entails.

State Water Resources Control Board Action

As a result of the Talent Decision, the California State Water Resources Control Board (SWRCB) adopted a Statewide General NPDES Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States. To avoid confusion and further litigation, the state of California and others within the jurisdiction of the Ninth Circuit Court (Alaska, Arizona, California, Oregon, Washington, Idaho, Montana, Hawaii, Guam and Mariana Islands) will now require any intentional application of a pesticide into waters of the US to have a general permit, which requires extensive sampling, analysis and reporting. Environmentalists are pleased with the new change in legislation; however, those in the pest control business are not happy with this new change.

In order to qualify for coverage under this general permit, herbicide applicators must meet the following criteria, including, but not limited to:

1. The applicator must submit a fully completed Notice of Intent, a project map, and first annual fee.
2. The applicator must be a public entity.
3. Applicators must be licensed by the Dept. of Pesticide Regulation or Dept. of Health Services if such licensing is required for such public entities to apply aquatic pesticides.

The basic requirements of this general permit include:

1. The applicator must follow all pesticide label instructions and any Use Permits issued by a county Agricultural Commissioner.
2. The applicator must implement Best Management Practices
3. The applicator must comply with monitoring requirements.

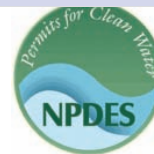
Reference:

1. Plater, Abrams, Goldfare, Graham, Heinzerling, Wirth. Environmental Law and Policy: Nature, Law, and Society. Aspen Publishers. New York, NY, 2004.

NPDES Update 2005 and the Pest Management and Fire Suppression Flexibility Act; H.R. 1749

BY MICHAEL L. KREBSBACH,
MONSANTO COMPANY

What are the latest developments surrounding the NPDES requirements for application of pesticides to waters of the United States?



Environmental Protection Agency

On August 13, 2003 the U.S. Environmental Protection Agency (EPA) published a notice in the Federal Register soliciting public comment on an Interim Statement and Guidance to address issues pertaining to coverage under the Clean Water Act (CWA) of pesticides regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) that are applied over water of the United States. Then on February 1, 2005 the EPA announced the interpretive statement developed after consideration of public comments. In that notice, EPA also proposed to revise the NPDES permit program regulations to incorporate the substance of the interpretive statement. The action of revision is a proposed rulemaking and notice of interpretive statement. Public comments on this action were requested to be received by April 4, 2005. The proposed rule is currently pending at EPA, and would codify the agency's position. The agency's position is the application of a pesticide to or over, including near, waters of the United States consistent with all relevant requirements under FIFRA does not constitute the discharge of a pollutant that requires a NPDES permit under the CWA.

Legislation on Capitol Hill

While EPA's proposed rule is certainly considered by many to be a positive development, the agriculture and non-crop industry believes that nothing short of legislation will remove the threat of lawsuits against those involved with making the type of pesticide applications in discussion. EPA has also acknowledged that a rule will not alleviate the threat of litigation. To rectify this concern, Congressmen Butch Otter (R-ID) and Dennis Cardoza (D-CA) have introduced H.R. 1749, the "Pest Management and Fire Suppression Flexibility Act," which clarifies and codifies the relationship between the CWA and FIFRA by stating that NPDES permits are not necessary when using FIFRA-registered products in accordance with label directions. The bipartisan bill was introduced April 22, 2005. The Senate companion bill by Senators James Inhofe (R-OK) and Blanche Lincoln (D-AR) was introduced June 7, 2005. The House Transportation and Infrastructure Subcommittee on Water Resources has jurisdiction.

The bill is currently in committee and a hearing is scheduled for late September. As of August 15, 2005 the bill had roughly 66 sponsors and the last day to sign on as an original cosponsor was June 16, 2005.

Senators Inhofe and Lincoln stated in a letter to their senate colleagues: "We are asking you to join us in

cosponsoring this vitally important legislation in response to judicial misinterpretations of the CWA that have expanded that statute far beyond Congress' original intent. As a result of the judicial decisions family farmers, mosquito-abatement and pest-control districts, irrigators, rural water districts, federal and state agencies, foresters, pest and lawn-care control operators and many others are not only subject to unnecessary, bureaucratic permitting requirements, but are under threat of lawsuit if they don't change their long-standing, expressly approved and heavily regulated pest management and public health protection practices.

State Water Resources Control Board

At this time the California State Water Resources Control Board has made comments on EPA's proposed rulemaking but not on H.R. 1749. The full text of the comments made by the State Water Resources Control Board on the draft rule can be found at www.waterboards.ca.gov/aquatic/index.html under the Comments bullet. In short the board has concerns with the proposed rulemaking, stating California believes that if USEPA wishes to create an exemption for pesticide applications conducted in compliance with FIFRA, it should seek revisions to FIFRA and/or the CWA, clarifying that NPDES permits are not required, rather than attempting to obtain that result through strained interpretations of existing law.

In summary, NPDES permits are still needed in California when making the type of applications covered under the permit. At the federal level actions are being taken to codify the CWA regarding the need for NPDES permits when making legal pesticide applications in, over or near waters of the United States. The California State Water Resources Control Board has yet to take a position on H.R.1749 but has commented on the proposed rulemaking, which is the basis for the legislative language. The fate of this bill is uncertain and may in part depend on EPA's response in October 2005 to comments on the aforementioned proposed exclusionary language amendment to the CWA. Regardless of the fate of this potential CWA amendment, the SWRCB may exercise its prerogative and/or bow to pressure from environmentalists to keep the aquatic pesticide permit using provisions of the Porter Cologne Act.

Sept. 9, 2005: The court has ruled that if the product was applied according to FIFRA, with no residue, and no unintended effect, than a NPDES permit is not required. ♦

Visit thomas.loc.gov to track HR 1749.

Lake Tahoe Basin Weed Coordinating Group: Bi-State, Watershed-Based Weed Management

SUE DONALDSON, UNIVERSITY OF
NEVADA COOPERATIVE EXTENSION

WENDY WEST, UNIVERSITY OF CALI-
FORNIA COOPERATIVE EXTENSION

The Lake Tahoe Basin is a classic example of a region where weed spread pressure is high, due to the bi-state border location, historical escaped ornamental populations, and the seasonal influx of tourists. Famed for its water clarity, the lake is the focus of many projects aimed at halting further degradation of lake water quality, but historically, invasive weeds have received little attention within the basin. In 1998, after locating a single perennial pepperweed (*Lepidium latifolium*) plant growing in Incline Village, University of Nevada Cooperative Extension (UNCE) mounted a public education campaign to identify other populations. It was worse than we'd thought! Surveys yielded 35 infestations, with the largest about a quarter acre in size.

Lake Tahoe is subject to intense scrutiny and rigorous environmental standards. Broad support and agreement were needed to reach consensus about approaches to managing the weed. The lake spans two states and five counties, with differing regulations governing pesticide use.

To build bi-state support for a solution to manage perennial pepperweed, UNCE convened a series of meetings that included major land management agencies: Tahoe Regional Planning Agency, Lahontan Regional Water Quality Control Board (LRWQCB), California Dept. of Food and Agriculture (CDFA), Nevada Dept. of Agriculture, city and county representatives, residents and others.

Current research suggests that growth of algae in the lake is fueled by inputs of phosphorus associated with sediment runoff. Expansion of tap-rooted perennial weeds, especially

in riparian areas, is expected to result in an acceleration of erosion rates. The group agreed that perennial pepperweed control was a priority, and that herbicides must be used in most instances. With



Site along bike path (above) in 1999 infested with perennial pepperweed and (below) in 2003, post treatment, as volunteers re-seed the site.



approval from LRWQCB and private landowners, chlorsulfuron was applied to infestations away from water by certified pesticide applicators in 1999 – 2001, with excellent results.

By 2001, however, perennial pepperweed was not the only invasive weed threatening the Tahoe Basin. At the request of the U.S. Forest Service (USFS), Lake Tahoe Basin Management Unit, a more formalized group called the Lake Tahoe Basin Weed Coordinating Group banded together to identify, map, and control invasive weeds. A meeting was held in January 2002 to determine the status of weeds within the basin, and the most pressing needs. Representation is broad, from agencies to land managers to residents (see box for major partners). Each entity has

varying capabilities and resources. The group is dedicated to raising levels of awareness and working together to ensure weed management is seamless and effective. The group operates as a Cooperative Weed Management Area under a five-year Memorandum of Understanding.

Initially, the group had no employees or hard funding available. At quarterly meetings chaired by Sue Donaldson (UNCE), the group crafts annual action plans with specified responsibilities relating to inventory, control, restoration, and education.

Subcommittees were formed to plan education and outreach efforts and to develop control strategies. The group regularly revisits the list of priority weeds, which has grown from 15 in 2002 to 20 today (see box). Control plans consider individual state law as well as the more stringent requirements of LRWQCB.

During the formation of the group, it was clear that concerns about the use of pesticides and their impacts, as well as potential fines from LRWQCB, could pose a barrier to effective weed control of certain perennial weed species. The group submitted a proposal to LRWQCB governing the use of three herbicides: glyphosate, clopyralid, and chlorsulfuron, that are registered in both Nevada and California. The proposal specifies the species on which the herbicides will be used; application best management practices; and categories of infestations requiring LRWQCB notification and consultation, based on site size, weed density, and

proximity to water. The proposal was approved and has been applied and renewed since summer 2003.

Due to the large volume of summer tourist traffic, the basin is especially vulnerable to weed infestation along transportation routes. A group priority was to find funding to allow basin-wide survey and rapid response control to occur. A USFS State and Private Forestry Grant, administered by CDFA, was obtained by the El Dorado County Agriculture Department in 2002. The grant funded survey and eradication efforts on the California side of the lake, while funding obtained via a National Fish and Wildlife Foundation Pulling Together Initiative grant allowed completion of basin-wide work. The Placer County Department of Agriculture has also received grant funding to complete detailed mapping and eradication work in their jurisdiction. Douglas County, Nevada has a functional weed district, and the district funds control.



During The Great Broom Sweep, Kim Melody talks to residents who turned in some broom. Free plants, *Potentilla* varieties, were given as replacements.

Total grant funds allocated to mapping and control average about \$70,000 per year, which is matched by over \$80,000 in in-kind contributions by group members.

The basin is also vulnerable to infestation from contaminated fill, gravel, and erosion control materials. In 1998, perennial pepperweed was found growing out of straw bales used for erosion control along a bike path rehabilitation project. We worked with the Tahoe Regional Planning Agency to change requirements for erosion control materials and to require the use of certified weed-free materials, and also have done several trainings for contractors who are learning how to apply best management practices. In 2004, the USFS inspected eight gravel pits for presence of invasive weeds.

In order to meet agency staff and general public educational needs, regular trainings are provided by group members. Group members also make presentations to homeowners' associations, environmental groups, and garden clubs, and staff booths at local events. Working with the Lake Tahoe Environmental Education Coalition's "Lake Tahoe Report" on KOLO TV, we have provided stories on three priority weeds. We also work with local print media to run stories in newspapers.

Education and outreach efforts have focused on several weed species. In 2003, with help from a \$4,000 grant from Nevada Department of Agriculture (NDOA), State & Private Forestry grants, UNCE helped form the Cooperative Weed Management Area and crafted public education materials highlighting the priority knapweed species. That year, a \$15,000 grant was also obtained from Nevada State Lands Lake Tahoe License Plate Program to fund development of a weed identification guide. The grant also provided funds to have weeds treated in areas where funding was not otherwise available. Additional grants from NDOA in 2004 (\$5,000) funded weed control and printing of the weed guidebook, and in 2005 we received \$12,500 to fund an invasive ornamentals campaign featuring Scotch broom (The Great Broom Sweep). Grant funds from the U.S. Boat Foundation have also been received to fund educational/action signage at marinas around the lake to help stop the spread of Eurasian watermilfoil. All grant funding sources have facilitated distribution of information through a variety of channels.

continued on page 14...

Priority Weeds

Musk thistle (*Carduus nutans*)
 Scotch thistle (*Onopordum acanthium*)
 Canada thistle (*Cirsium arvense*)
 Russian knapweed (*Acroptilon repens*)
 Diffuse knapweed (*Centaurea diffusa*)
 Squarrose knapweed (*Centaurea squarrosa*)
 Yellow starthistle (*Centaurea solstitialis*)
 Purple starthistle (*Centaurea calcitrapa*)
 Scotch broom (*Cytisus scoparius*)
 Hoary cress (*Cardaria draba*)
 Sulfur cinquefoil (*Potentilla recta*)
 Klamathweed (*Hypericum perforatum*)
 Curlyleaf pondweed (*Potamogeton crispus*)
 Bull thistle (*Cirsium vulgare*)
 Eurasian watermilfoil (*Myriophyllum spicatum*)
 Perennial pepperweed (*Lepidium latifolium*)
 Spotted knapweed (*Centaurea maculosa*)
 Dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*)
 Yellow toadflax (*Linaria vulgaris*)
 Oxeye daisy (*Chrysanthemum leucanthemum*)

Major Partners

U.S. Forest Service, Lake Tahoe Basin Management Unit
 El Dorado County Agriculture Department
 Placer County Agriculture Department
 Douglas County Weed District
 Washoe County Roads Department
 Nevada Department of Agriculture
 California Department of Food and Agriculture
 University of Nevada Cooperative Extension
 University of California Cooperative Extension
 Tahoe Resource Conservation District
 Nevada Tahoe Conservation District
 Lahontan Regional Water Quality Control Board
 Tahoe Regional Planning Agency
 California State Parks
 City of South Lake Tahoe
 California Tahoe Conservancy

LOOK AROUND BEFORE YOU SPRAY

VANELLE CARRITHERS,
DOW AGROSCIENCES

BASIC STEPS CAN REDUCE THE POTENTIAL FOR SPRAY DRIFT AND VOLATILITY.

We all know spray drift and volatility can injure off-target plants and anger neighbors. But with a little forethought and planning, you can greatly reduce the risk of these potential negative outcomes.

Occasionally, we receive inquiries about the potential for spray drift and volatility when using Dow AgroSciences products. When dealing with herbicides that can affect non-target crops, it is important to be well informed and make application decisions with the total environment in mind. Choosing the correct timing, location, application method and herbicide go a long way toward reducing the potential for injury from drift or volatility.

The first step to take when preparing to treat weeds or brush is to assess the treatment area and get a feel for your surroundings. Identify where your target weeds are in relation to nearby off-target crops or plants, such as broadleaf crops, grapes and tomatoes. Then, select the product and time to use it that will best control the target weeds while minimizing the potential for injury to off-target plants.

Spray at the right time

In many ways, timing is everything. To achieve the right timing, you have to consider the time of year, time of day, growth stage of the target weed and surrounding off-target plants and weather conditions. In the case of dormant applications, timing can greatly reduce the potential for off-target injury. Many tough, woody species, such as blackberries and poison oak, can be controlled during the winter with dormant-season low-volume basal or dormant stem applications of Garlon® 4 herbicide at a time when most susceptible crops are dormant or are not present (between growing seasons). Dormant stem applications work very well on woody plants, especially blackberries, and many brush species using Garlon 4 at the labeled rate of 1 to 2 percent volume/volume with a crop or seed oil additive at 2 to 3 percent volume/volume in water to make 100 gallons total mixture.

If dormant applications are not an option, take into consideration when surrounding susceptible crops are in their most sensitive growth stages, and try to avoid making applications during those times. Most crops are more susceptible to injury when they are rapidly developing vegetative growth in the spring,



Low-drift application tools like this Brown Brush Monitor sprayer reduce the number of fine spray droplets.

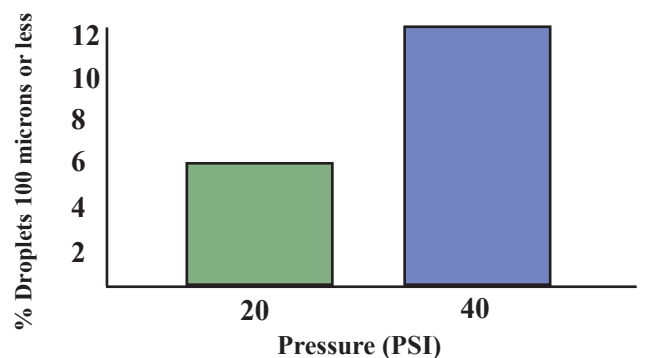
or at flowering. Weather also plays a key role. Monitoring wind speed and direction, air temperature changes and potential rain and air inversions can help control the potential for spray drift and volatility.

Wind is especially efficient at moving small spray droplets considerable distances. Never treat if wind speeds are greater than 10 mph. Light winds can cause problems, too. Winds blowing at less than two mph can change direction suddenly. To prevent

damage, give yourself a buffer zone in all directions when wind speeds are low. Four to six mph winds blowing away from susceptible plants are best for applications. Be sure to follow the label and state regulations on wind speed and applications.

Using low-drift application tools can help reduce the potential for physical drift. They reduce the number of fine, or small, spray droplets that are more likely to drift. Shielded boom sprayers, the Brown Brush Monitor™ sprayer, reduced pressure and appropriate nozzles, low-drift boomless nozzles and air induction spray tips (which greatly reduce fine droplets) all help keep herbicides where you apply them.

Spray Pressure and Droplet Size



Doubling the pressure can double the percent of fine droplets. Data obtained using a Flat Fan Nozzle (8004) - 0.6 GPM. www.tamu-commerce.edu/agscience/ppt/drift.ppt

TIPS FOR PREVENTING SPRAY DRIFT AND VOLATILITY

- Use a combination of pressure and nozzles that minimize small droplets
- Adjust equipment to produce a coarse spray at low to medium pressure
- Keep nozzles and spray wands as low to the ground as possible during application
- Use equipment properly, and avoid waving nozzles and wands excessively
- Don't apply if wind speeds exceed 10 mph, or during an inversion
- Consider extended buffer zones in all directions when wind speed is less than two mph
- Avoid applications when temperatures are high or will be high later in the day
- Minimize spraying on impervious surfaces
- Apply when nearby off-target crops are less susceptible, or dormant
- Use the lowest-volatility formulation when sensitive crops are nearby

Droplet size is the number one drift factor. Smaller, unseen droplets will drift, and increasing spray pressure greatly increases the number of small or fine droplets (see chart). Backpack and hand-pump sprayer pressures vary greatly during use and therefore create a large variation in droplet sizes. When using these sprayers, an inexpensive pressure regulator, or constant flow valve, will help reduce high or variable pressures and small droplets. Be sure to adjust nozzles to coarser settings to increase droplet size, improve coverage, and reduce off-site movement. Using a coarse spray at low to moderate pressure prevents the formation of fine droplets that are a high risk for drift. Also, when applying with a backpack sprayer or other hand-held wand, keep spray as low to the ground as possible.

Reduce volatility potential

Volatility is yet another key factor in the off-target equation. Volatility is when a spray settles on the application site and evaporates. There may be a potential for this vapor to move off-site through wind or air inversions. As with drift, however, there are ways to reduce the potential for volatilization.

Choosing the right herbicide can make a big difference. Use the lowest volatility formulation of your preferred product when possible. For example, Garlon 3A herbicide is an amine formulation of triclopyr that is classified as essentially non-volatile, and, in certain situations, it can provide similar control as Garlon 4. In situations where daily temperatures can be high and the potential for volatility is a concern, Garlon 3A is your best option.

Application placement also can influence the potential for volatility. Garlon 4 applied to plant leaves absorbs rapidly through leaf cuticles. Thus, less is available to volatilize. Avoid spraying impervious surfaces such as rocks, bare ground or pavement as much as possible in hot weather. Herbicides can evaporate quickly off these surfaces, increasing the chance for off-target injury. Temperature has a huge effect on volatility. Volatility increases exponentially with higher temperatures. To avoid this problem, make applications on cool days, or well before or after the heat of the day. Or as noted above, choose a formulation that is essentially non-volatile.

Spray in the right place

Topography is another factor that can greatly affect spray drift. Note how hills and valleys will affect air currents around your spray site. As air warms during the day, it rises; this may cause air currents in ravines, valleys and ditches to move herbicide up and out if you have sprayed in a low-lying area.

Another condition to be aware of is an air inversion. A local low-level inversion occurs when the temperature of the air at ground level is cooler than the air above it. The warmer air above it traps the cooler air, greatly reducing air mixing. Pesticides applied under these conditions remain concentrated in the air (droplets may never settle on the spray site) and may be more prone to drift and cause off-target damage.

Temperature inversions usually occur between sunset and sunrise and can last all night. However, morning inversions can be short-lived due to the air at ground level being warmed by the sun. Some indications an inversion might occur, or is occurring, include: previously clear skies with little or no wind, the air at ground level is cooler than the air above, ground fog, hanging dust or smoke, or frost. If these conditions exist, it's best to wait for another day to make your application.

There are many factors to consider when planning a herbicide application. By being aware of your surroundings and environmental conditions, and by making informed decisions ahead of time, you can help ensure that your application is a success. The most important thing to remember is that you make the final decision whether or not to spray. Always take time to look around to make sure conditions are favorable and that you have taken every step possible to reduce the likelihood of spray drift, volatilization and off-target injury.

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Always read and follow label directions.

Brown Brush Monitor is a trademark of Brown Manufacturing Corporation. Patent #6101798. ♦

HIGHLIGHTS FROM CDFA'S WEED BIOLOGICAL CONTROL PROGRAM

BY CHERYL WOODS, CDFA

We humans have used biocontrol to our advantage for ages. Consider the ancient practice of cat ownership. When the rats and mice became too numerous, a natural predator, such as a cat, would decrease the rodent population to a manageable size. Like most pest plant species, invasive plants were imported from other countries without their coevolved herbivores. Without herbivores, weed populations grow unrestrained and can displace other more desirable plants such as crops and native plants. Similar to the cat and mouse scenario, by introducing natural herbivores of invasive plants, weed populations may be reduced to manageable levels.

California has one of the largest weed biological control programs in the world. Biological control is the use of natural enemies to reduce densities of insect pests and weeds. Releases of natural enemies may be made once, resulting in permanent establishment, or it may be necessary to continue to make augmentative releases. Biocontrol is a global scientific strategy for managing pests that has been conducted for over 100 years and has resulted in many successful programs. The reason biological control is relatively safe and effective is that a high degree of host-specificity for the target is sought before a potential control organism can be released into the environment. This protocol ensures that effects on non-target species are minimized and that the agents are likely to be efficacious.

For all biocontrol program projects, two goals must be reached for a project to be successful:

1. Establishment of the agents
2. Development of a high population of agents, which results in significant decreases in the weed population

HIGHLIGHTS

1. *The Squarrose Knapweed Biocontrol Project:*

Squarrose knapweed, *Centaurea squarrosa*, is found in only a few northern locations in California. Unfortunately squarrose knapweed has existed in these locations for well over 50 years and spread locally over many acres. Because of this historical spread, California has the largest infestation of this weed in the United States, second only to Utah. Baldo Villegas and Dale Woods manage the squarrose knapweed biocontrol project. Until recently, squarrose knapweed was the only knapweed in California that had no biocontrol agents. Villegas and Woods released the insects that are known agents on diffuse and spotted knapweed, two plants closely related to squarrose knapweed, and they found that these insects did more damage to the squarrose knapweed than to the other knapweed species. They began by releasing two species of seedhead weevils, then added a root feeding beetle.

The first goal for successful biocontrol projects is establishment. Between the years of 1998 and 2003, the biological control program released over 51,000 of the seedhead weevils (*Larinus minutus* and *Bangasternus fausti*) on 54 squarrose knapweed sites, and 316 root beetles

CDFA Weed Biocontrol Program



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Associate Environmental Research Scientist (Entomologist)
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Dale Woods

Senior Environmental Research Scientist/State Plant Pathologist
Ph.D. Plant Pathology, University of California, Davis 1983

(*Sphenoptera jugoslavica*) at 9 sites. Currently 29 sites are being monitored annually for the establishment and reproductive capabilities of the seedhead weevils. After 4 years, almost all the monitored sites had good establishment results.

“Overall, the squarrose knapweed project appears to be the most promising weed biocontrol project in decades for California. The virtual elimination of seed production coupled with the potential of the root beetle is expected to have dramatic impacts on the density of California’s most prevalent knapweed.”

- Dale Woods

The second goal is the development of a high population. In the case of squarrose knapweed, the seedhead weevils increased population density until almost every seed head was attacked. On average, seed destruction is over 90% in an infested seedhead. In many of the sites the biocontrol team was not able to find any viable seed in over 500 seedheads evaluated at each site. In addition, the root beetle larvae make their own contributions. The larvae make large cavities in the taproot. Due to the loss of root stability and function, severely attacked plants wilt and have a shorter lifespan. Three of the sites are being monitored for plant population/density. The results suggest that with the elimination of seed production by the seedhead weevils there are fewer new plants able to develop. As the mature plants age and die, the knapweed population density declines.

Some additional statistics from monitored knapweed sites:

Site 1 - weevils were released in 1998 and the plant density declined from 124 plants per square meter in the spring of 2001 to 5.5 plants per square meter in the spring of 2005.

Site 2 - weevils were released in 2002 and the plant density declined from 65 plants per square meter in the spring of 2004 to 41 plants per square meter in the spring of 2005.

Site 3 - weevils were released in 2003. It’s too early to see a decline in plant density.



2. The Water Hyacinth Biocontrol Project:

Currently Pat Akers is focusing on water hyacinth, *Eichhornia crassipes*. Water hyacinth is an aquatic plant originally from the Amazon. It was introduced in 1884 as an ornamental, but in following years it escaped and covered waterways and interfered with shipping in the southeastern United States. Water hyacinth is now found in the San Francisco Bay, South Coast, the Sacramento/ San Joaquin Delta, and the man-made waterways in the Central Valley. The California Department of Boating and Waterways has decided to invest in biocontrol in an attempt to pursue alternatives to their herbicide

spray program. Aker’s objective is to use the water hyacinth’s natural herbivore, the weevil *Neochetina bruchi*, to control the population of this plant. The hyacinth weevil eats and nests in the plant, and is the only one of three different insects originally released to control the

hyacinth that seems to survive in California’s mild climate. Aker’s project includes examining the role of temperature, humidity, and



Squarrose knapweed (top), Dale Woods.
Yellow starthistle rust (middle), by Dale Woods.

Water hyacinth damaged by the weevil, *Neochetina bruchi* (bottom), by Pat Akers.

nutrients in the population growth of the weevil.

3. The Yellow Starthistle Project:

Yellow starthistle, *Centaurea solstitialis*, is one of the highest priority projects in the biological control program. Yellow starthistle has managed to cover vast fields, leaving us with decreased land value and limited access to recreational areas. Dale Woods and Baldo Villegas are now establishing a rust, *Puccinia jaceae* var. *solstitialis* that attacks the weed. This rust was collected

continued on page 14...

Biocontrol continued from page 13.

in Turkey and the biocontrol program brought it to the United States after being issued a permit to release it in 2000. The rust itself attacks the leaves, weakening the plant. Later, one of the many biocontrol agents that have been established will attack the seed heads. The attack by the rust complements the attack by the insect. For this project, Woods cultivates the rust in a greenhouse, and he and Villegas hold workshops for counties interested in the rust for their own yellow starthistle problems. In projects such as these, Villegas is in charge of implementation workshops, while Woods conducts the impact studies including monitoring the impact of the insects on other plants and the surrounding area to make sure that only the target species is affected. The rust was considered to be the biggest advance of the summer 2004 season.



Squarrose knapweed. Photo provided by Kevin Martyn, Shasta County.

The biocontrol program has had a very exciting year, with all the results piling in from years of observation and work. It takes years to observe any change in plant and insect populations. Biocontrol staff have seen some very positive results in the last few years and are continuing to monitor their projects and expand their program to other invasive weeds.

For more information on biological control:
www.cdffa.ca.gov/phpps/ipc/biocontrol/biocontrol_hp.htm ♦

Tahoe Basin WMA continued from page 9.

Coordination of outreach efforts was boosted in 2004 when grant funds from USFS State and Private Forestry allowed for the hiring of an Outreach Coordinator based in South Lake Tahoe with the Tahoe Resource Conservation District. The coordinator's first task was to complete a weed identification and control guide targeted for local homeowners.

In 2004, 1,535 miles were surveyed on the California side of Lake Tahoe, and 352 miles on the Nevada side. A total of 157 historical weed infestations were documented and treated, and 161 new infestations were identified and treated.



Tahoe Weed Tour, 2002, Eurasian watermilfoil harvester at Tahoe Keys.

We are beginning to see a decrease in new infestations as well as good control of historic infestations. Our early detection program enabled the identification and removal of three yellow starthistle plants in 2003, and two in 2004, indicating that we are effectively excluding this priority weed. Major progress has been made on the largest infestation of perennial pepperweed, and the site has been seeded with native grass species to allow continued control of the perennial pepperweed with chlorsulfuron.

One challenge the group faces is our current inability to apply a complete "tool box" of weed control methods, including herbicides, on Forest Service lands. By the end of 2004, a total of 263 weed-infested sites covering 112.25 gross acres had been documented on LTBMU forestlands. In 2004, a full-time employee was funded by LTBMU to coordinate the invasive weed program. During the growing season, 74 new sites invaded by weeds were documented. Seasonal employees assisted with mechanical weed treatment (pulling, clipping, or digging) and monitoring. Until environmental impact statements or assessments can be completed; however, chemical controls cannot be used. ♦

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 Wendy West, wkwest@ucdavis.edu



The Pacific Northwest Weed Management Handbook is now online at:

pnwpest.org/pnw/weeds?status.html

The handbook includes information on insects and diseases and a great photo gallery.



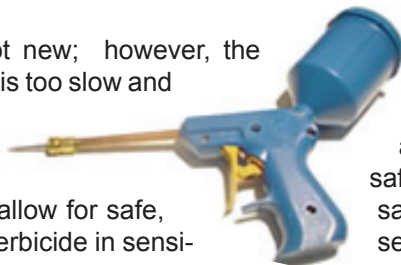
Toolbox: JK Injection System

JK International, LLC provides new herbicide delivery system

TOOLBOX highlights new tools that might integrate well into local weed management tool boxes. Noxious Times does not specifically endorse tools featured, but rather strives to provide information that will lend itself to further examination and research on the part of the user.

Is herbicide injection new?

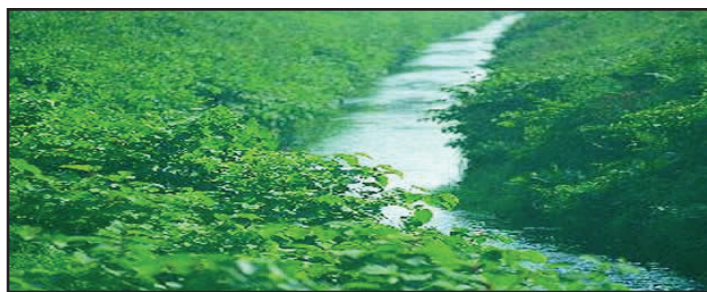
Injecting herbicide into plants is not new; however, the method of using a probe and syringe is too slow and inefficient. JK International created a delivery system that increases the speed, safety, and consistency of stem injection. This new tool will allow for safe, consistent and controlled usage of herbicide in sensitive environmental areas.



What does the tool use?

The herbicide creators suggest the use of either Aquamaster or Rodeo, which are labeled for this method. These are glyphosate-only herbicides and have no surfactants. Glyphosate is one of the safest herbicides in use. Being compared to an intense salt compound, it is allowed for use in and around our sensitive watersheds.

The JK Injection System is primarily made of Acetal. Acetal is known for exceptional dimensional stability, resistance to creep and vibration fatigue, low coefficient of friction, and high resistance to abrasion and chemicals. Due to heavy in-field use and non-corrosive parts requirements, this tool is lightweight, exceptionally durable, and can be easily maintained and adjusted in the field. Approximately 40 parts make up the gun, which are all corrosion resistant, high grade materials.



Knotweed taking over riverbanks.

What does the tool do?

The JK Injection System offers the ability to inject a measured amount of herbicide into the hollow base canes of plants, increasing the effectiveness of the herbicide, without having to cover the leaves and exterior of the plant and risking damage to surrounding flora.

Please visit www.jkinjectiontools.com for instructions on how to use this tool.

According to JK International, "The efficacy of stem injection more than compensates for the initial time investment, when compared with other methods that require repeated visits over 2-3 years. This net increase in efficiency will ultimately reduce the cost of weed control for government agencies and community groups."

New for 2005:

Short JK Needles

Hardened JK Needles



JK
Holsters



Coming soon:

New needle for yellow flag iris

Approved injectable plants:

- Japanese knotweed
(*Polygonum cuspidatum*)

Pending approval for 2006:

- giant hogweed
- *Arundo donax*
- poison hemlock
- bamboo
- thistles



More info: www.jkinjectiontools.com



UPCOMING EVENTS

September 19 - 20, 2005

7th Annual Weed Management Area Meeting

Heidrick Agricultural History Center

Woodland, CA

gskurka@cdfa.ca.gov

September 21, 2005

Biological Invasions IGERT Fall Symposium

Environmental Sciences Building

Davis, CA

www.cpb.ucdavis.edu/bioinv/

October 19-22, 2005

SERCAL's 12th Annual Conference

Restoring the Heart of California

The Pines Resort & Conference Center

Bass Lake, CA www.basslake.com

www.sercal.org

November 16-19, 2005

CARCD's Annual Meeting

Fire, Water, Weeds:

Living within our Environment

Bahia Resort, San Diego, CA

www.carcd.org

NIWAW 2006 Poster
Get 'em while they're hot!



E-mail request: gskurka@cdfa.ca.gov

May 25-28, 2006

Weeds Across Borders 2006

Hermosillo, Sonora, Mexico

www.desertmuseum.org/borderweeds

"Gardens & Guppies: Working together to prevent introductions of invasive species via the horticulture and aquarium trades"

September 21, 2005, 8:30am - 5:00pm

**Plant and Environmental Sciences Bldg
Room 3001, UC Davis**

Ever wondered what role hobby industries like the horticulture and aquarium trade play in the introduction of invasive species? This symposium will provide a forum for researchers, agency personnel, and industry representatives to discuss the issues surrounding invasive species that originate via escapes from gardens and aquaria. Speakers include Jamie Reaser (Ecos Systems Institute), Sarah Reichard (University of Washington), Marshall Meyers (Pet Industry Joint Advisory Council), and Pat Thalken (California Department of Food and Agriculture). A UC Davis graduate student group will present results from its two-year collaborative study of the horticulture and aquarium industries in the San Francisco Bay-Delta region.

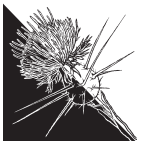
For more information about the symposium or to download a registration form, visit:

www.cpb.ucdavis.edu/bioinv/g&g.html

Registration is free, space is limited.
Sponsored by the UC Davis Biological Invasions
IGERT and National Science Foundation.

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